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(56) Documents Cited
GB 2273073 A
GB 2204263 A
WO 1999/044789 A1
WO 1995/013165 A1
US 5775680 A
US 5443246 A

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(54) Abstract Title
A modular bar clamp

(57) A bar clamp comprises a modular assembly of units, including frictional quick-release means. Preferably the bar clamp includes a drive bar 3 upon which is located a handle 5 and a clamp head 2. A manually operated trigger 6 may be provided on the handle which is actuated so as to move the handle and clamp head along the drive bar, in order to achieve a clamping action with another clamp head. Once the clamp heads are in position the handle may be retracted from the clamp head by disengaging a locking device 9. A frictional quick release lock 12 may be provided on the clamp head in order to prevent movement out of the clamping position.

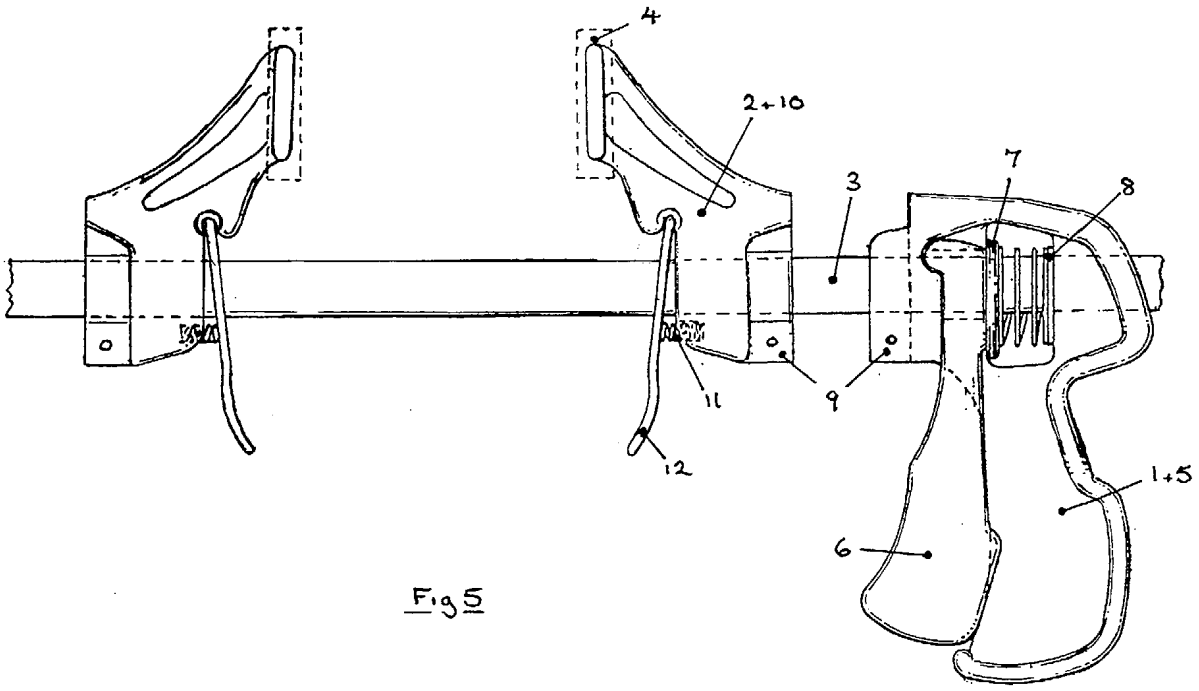

Fig 5

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

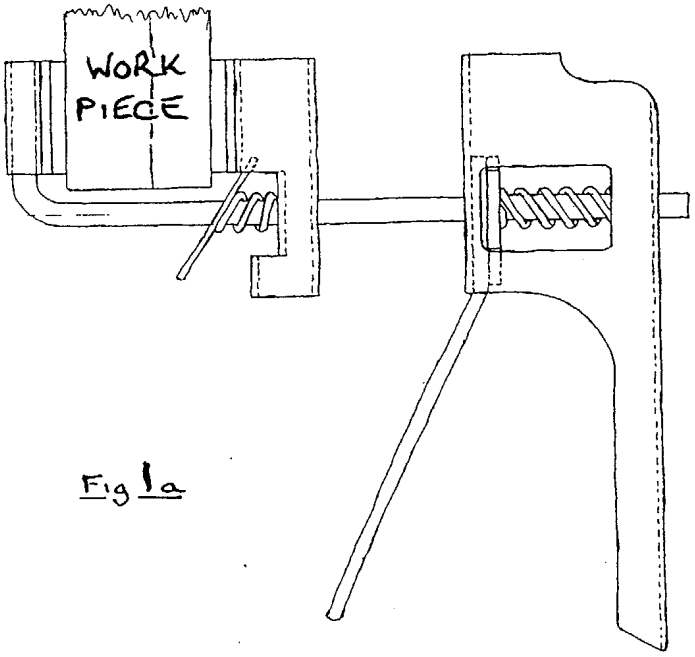


Fig 1a

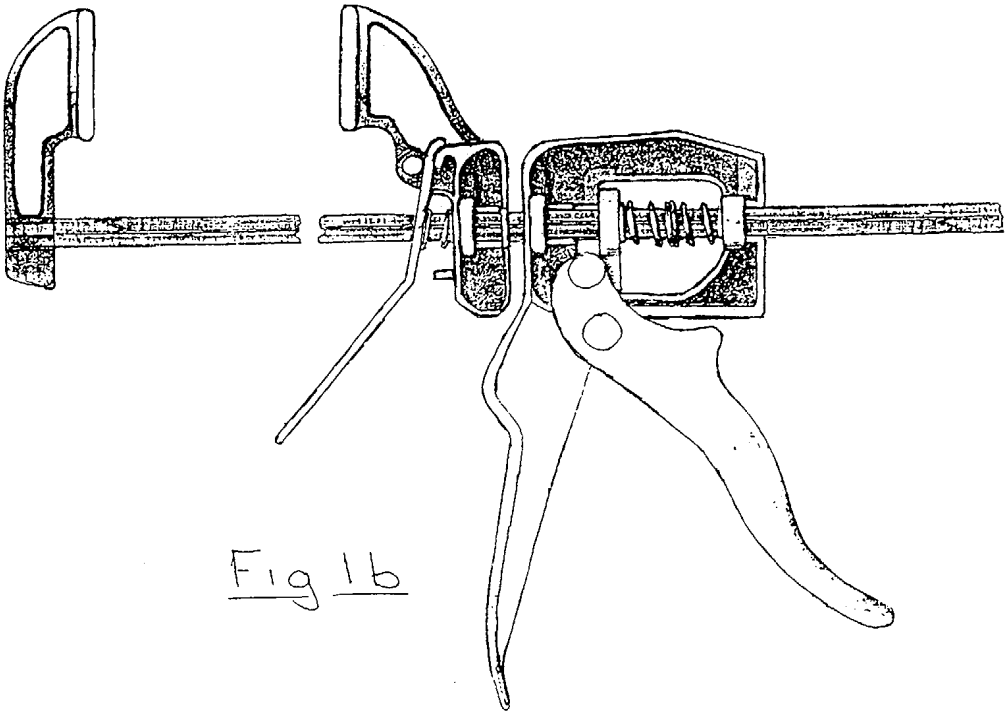
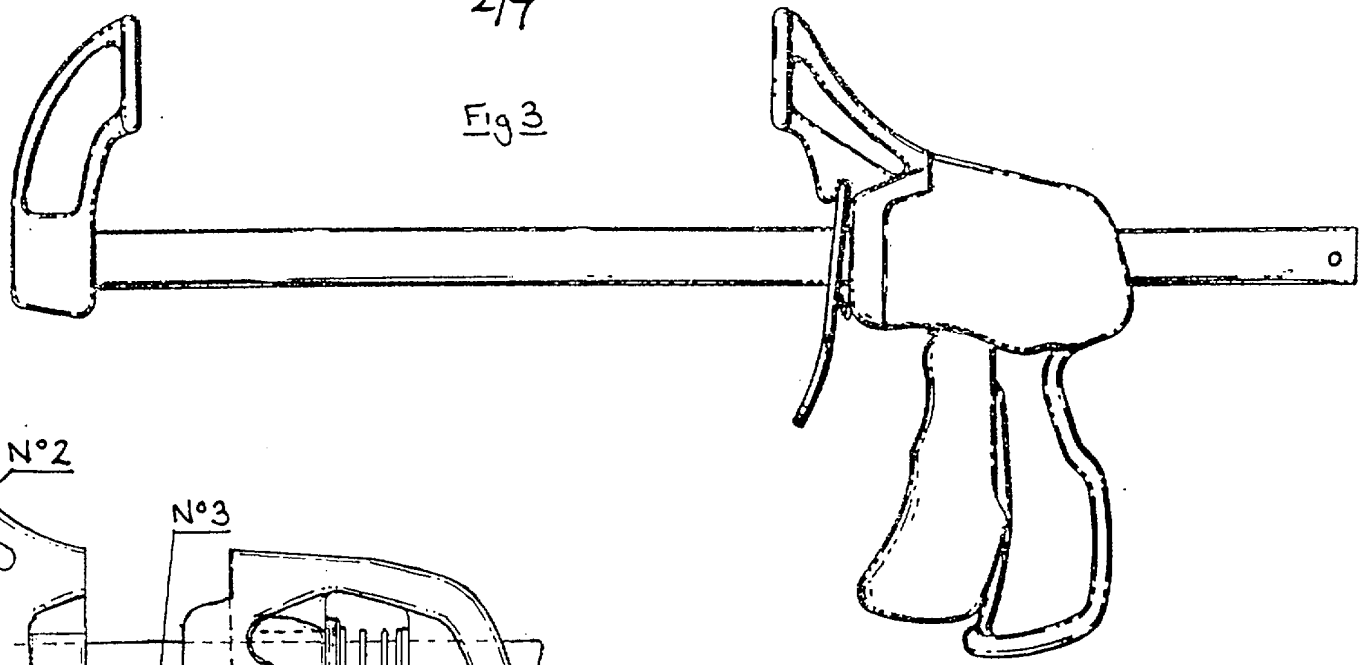


Fig 1b

Fig 3



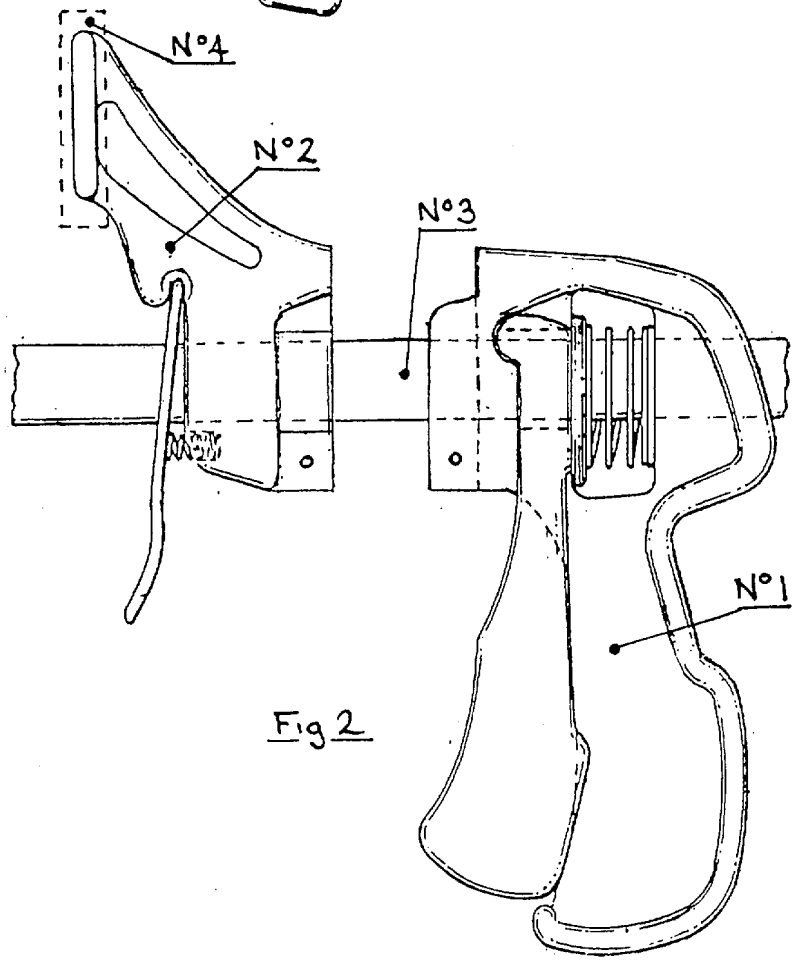
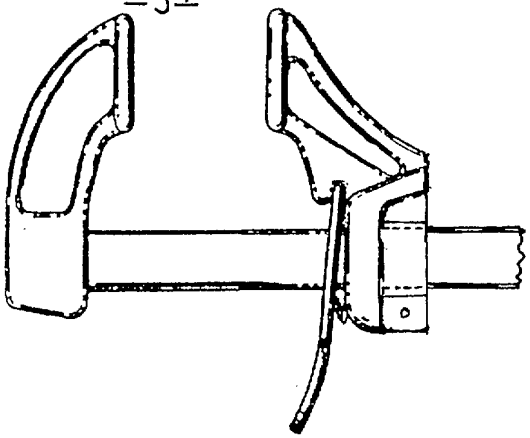


Fig 2

Fig 4



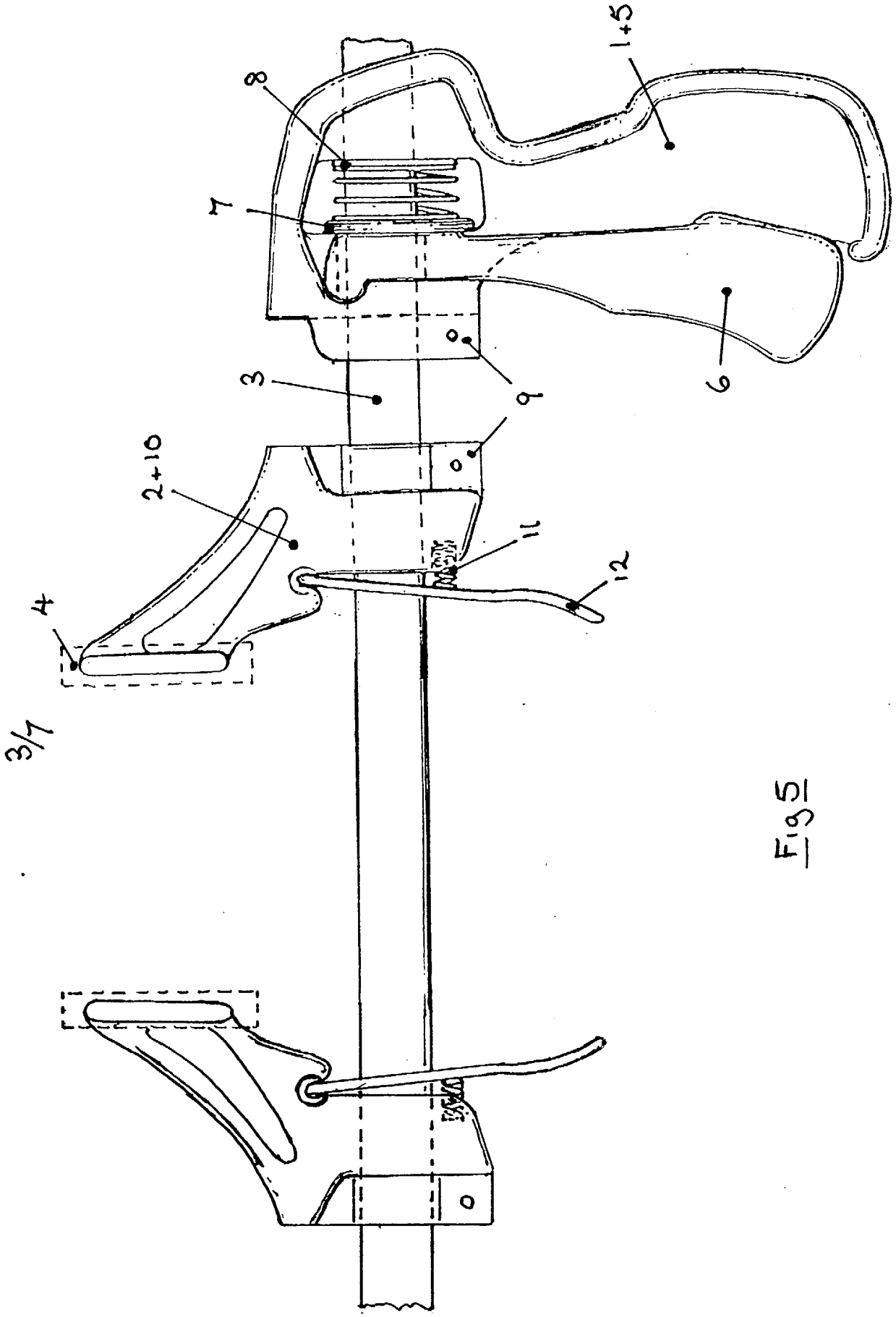


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Fig 5|

Fig 6a

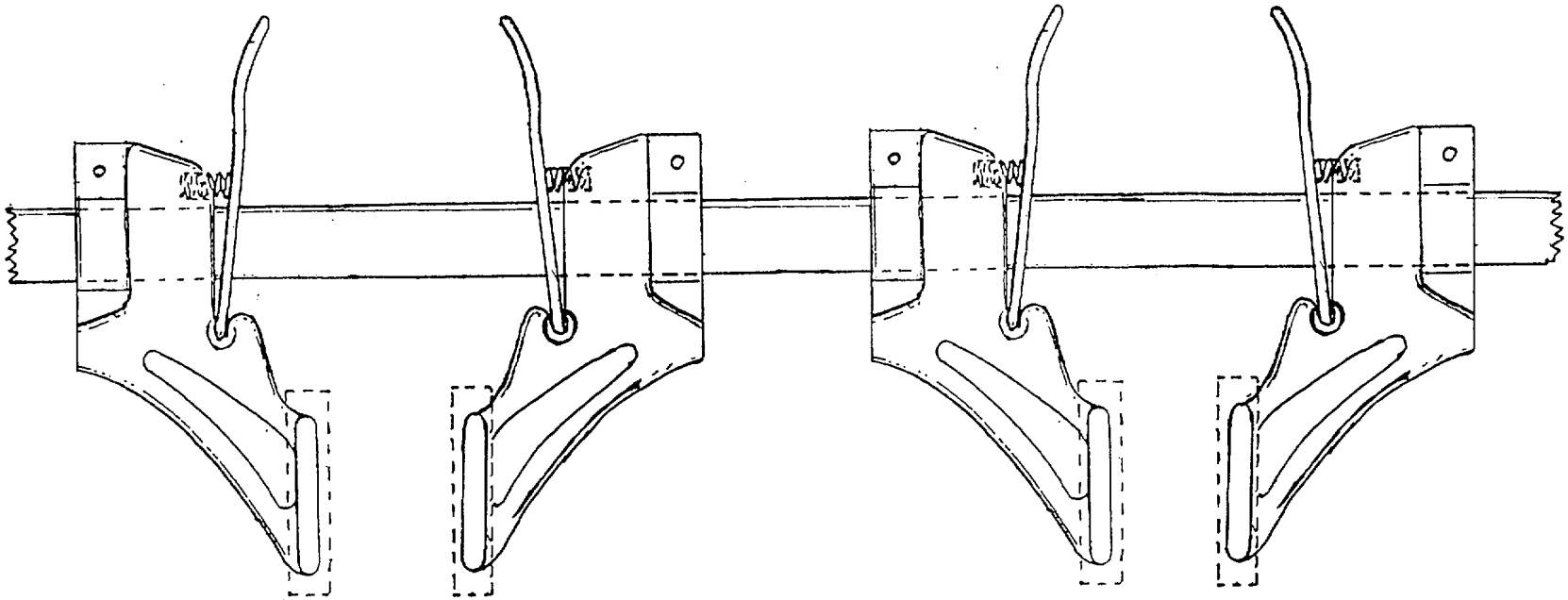


Fig 6b

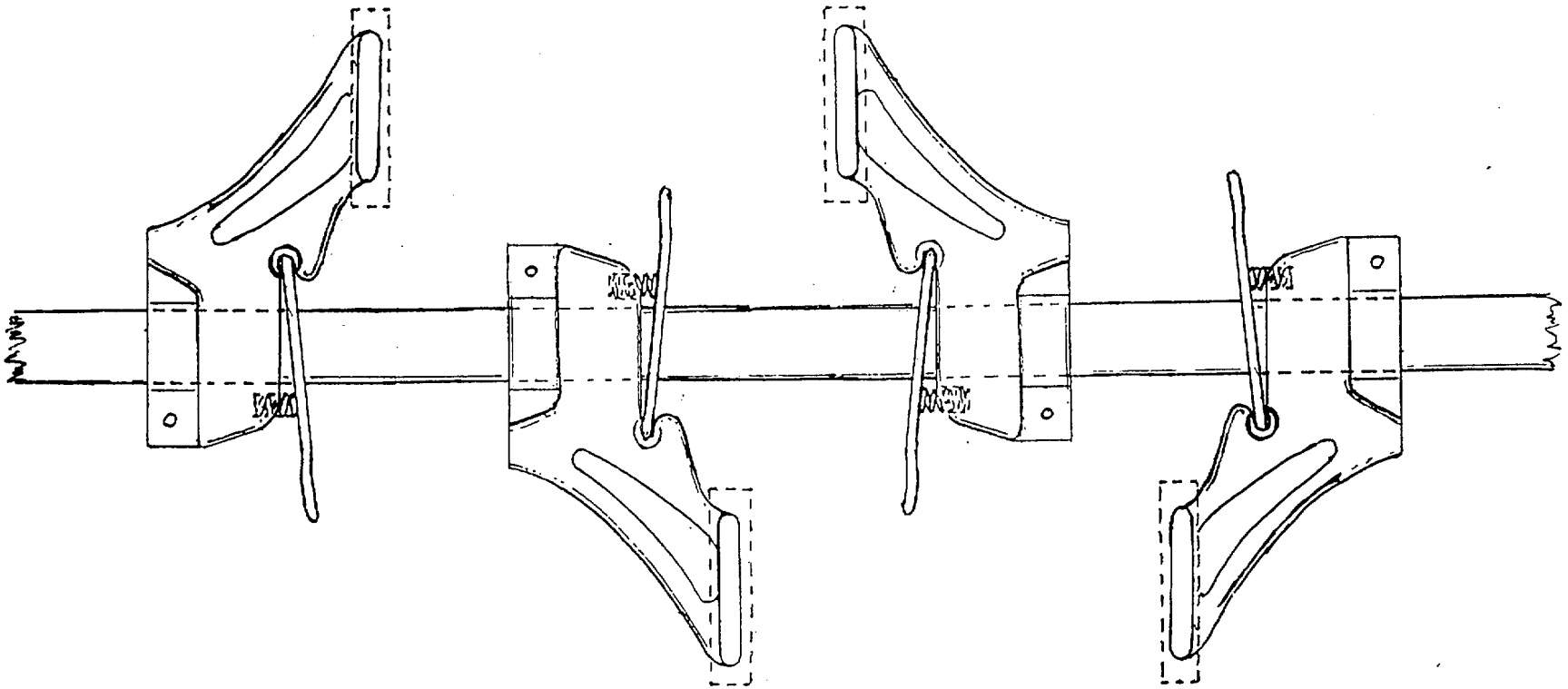


Fig 7

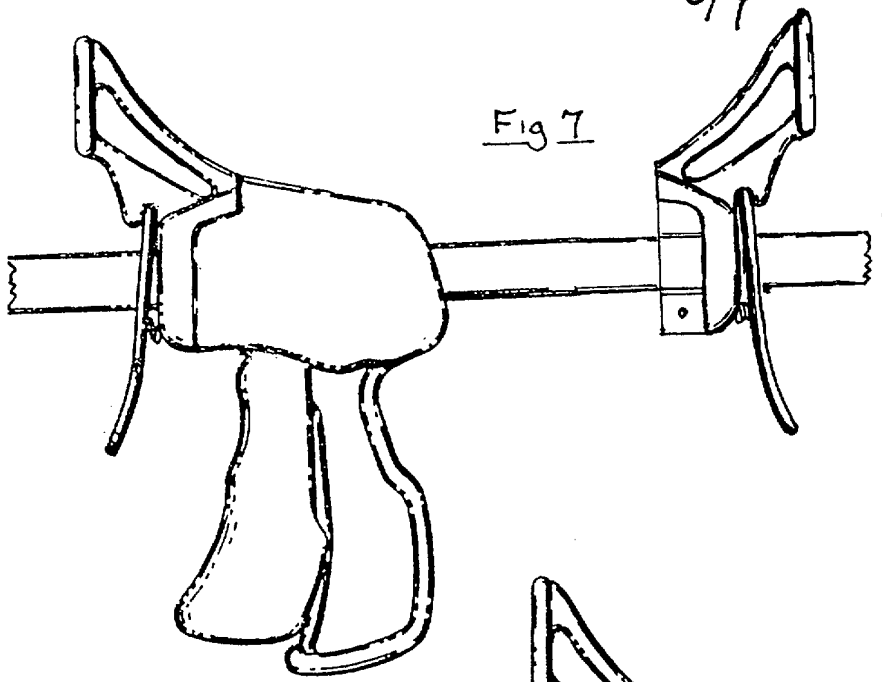
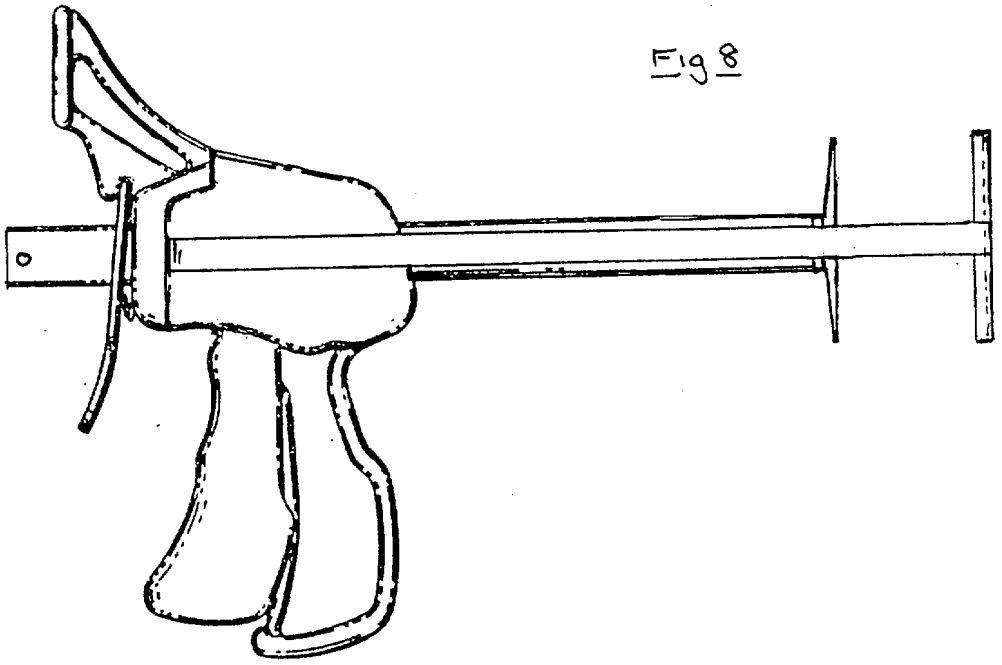


Fig 8



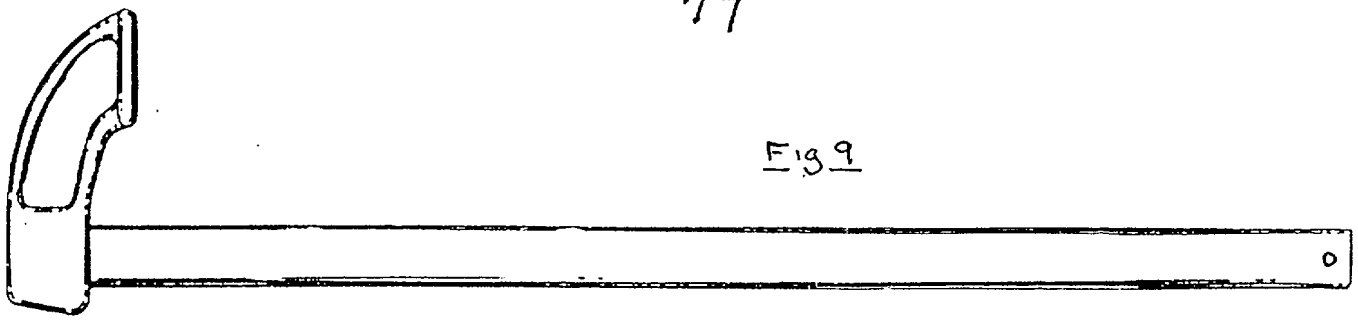
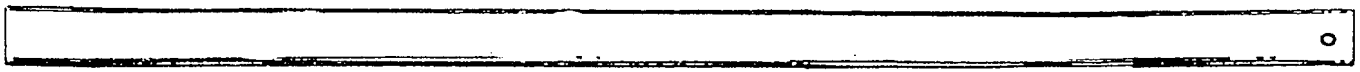


Fig 9

Fig 10



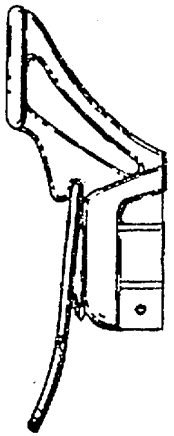


Fig 11

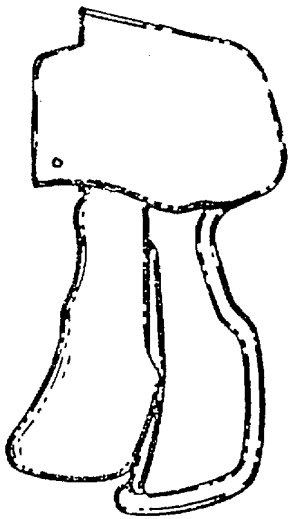


Fig 12

A MODULAR INTERCHANGEABLE BAR CLAMP

THIS INVENTION RELATES TO A MODULAR ONE HANDED FAST LOADING, QUICK RELEASE BAR CLAMP.

BACKGROUND OF THE INVENTION.

THIS CLAMP IS DESIGNED FOR A ONE HAND OPERATION AND WOULD BE OF A QUICK RELEASE TYPE, THE INVENTION RELATES GENERALLY TO IMPROVEMENTS IN BAR CLAMPS AND MORE PARTICULARLY THE QUICK GRIP FAMILY OF CLAMPS.

THE CONCEPT OF A QUICK RELEASE ONE HANDED OPERATIONAL CLAMP MANIFESTED ITSELF IN THE SPRING OF 1988 WHEN A PROTOTYPE OF THE IDEA WAS MADE AND PROVEN BY THE APPLICANT OF THIS DOCUMENT. THE IDEA WAS CONCEIVED FROM COX'S MASTIC GUN WHICH IS A CAULKING TUBE APPLICATOR THAT EMPLOYS A SHUFFLE PLATE AND FRICTIONAL TRIGGERS MAKING A DRIVE BAR EXTENSION MECHANISM. IT WAS OBSERVED THAT WHILST THE CAULKING ACTIVITY WAS TAKING PLACE A CLAMPING FUNCTION COULD BE DEVELOPED FROM THE SAME MECHANICAL ACTION.

THE DRIVE BAR EXTENSION COULD BE UTILISED BY ENGAGING A FIXED CLAMP FACE ONCE THE TUBE HOLDER WAS REMOVED. THE FIXED CLAMP FACE WOULD BE AN EXTENSION FROM THE MASTIC GUN BODY SIMILAR TO A 'G' CLAMP DESIGN, ITS MAIN WEAKNESS WAS IN THE LIMITATIONS OF 'G' SHAPE LENGTHS AND STRENGTH IN THE FRAME. LOOKING FOR IMPROVEMENTS THE NEXT STEP WAS TAKEN, WITH THE SAME DRIVE BAR EXTENSION MECHANISM THE FIXED CLAMP HEAD WOULD BE AT THE REAR PROTRUDING UPWARDS FROM THE BODY OF THE MASTIC GUN, THE DRIVE BAR WOULD NOW RETRACT TOWARDS THE FIXED CLAMP FACE, AGAIN THERE WAS A WEAKNESS IN THE DESIGN WHICH WAS THE AWKWARD HANDLING ABILITIES WHEN CLAMPING.

TO GIVE BETTER HANDLING ATTRIBUTES AND A MORE STURDIER CLAMP WITH GREATER FLEXIBILITY IN CHOICES OF CLAMPING DISTANCES A THIRD DESIGN WAS MADE. THE SHUFFLE PLATE AND TRIGGERS SYSTEM WAS REVERSED TO GIVE A DRIVE BAR RETRACTION MECHANISM WITH IMPROVED HANDLING PERFORMANCE, NOW KNOWN AS THE QUICK GRIP TYPE OF CLAMP. ALL THREE OF THESE DESIGNS ARE NOW BEING MANUFACTURED AND MARKETED, PRIOR TO U.K. PATENT No 2221641 AUG 1988 THEY DID NOT EXIST.

THE MODULAR DESIGN WAS ANOTHER IMPROVEMENT CREATED IN JAN' 1989, TO GIVE INTERCHANGEABILITY OF PARTS AND TO REDUCE COSTS TO THE CONSUMER WITH A PROFITABLE SPIN OFF FOR THE MANUFACTURER ie LESS COMPLICATED TOOLING AND CREATING A SPARES MARKET. BUYING ONE CLAMP FOR ONE FUNCTION IS EXPENSIVE TO THE PURCHASER WHICH CAN BE REDUCED BY BUYING INDIVIDUAL COMPONENTS. A HANDLE THAT IS RE-USABLE FOR ANOTHER OPERATION ONCE THE CLAMP IS IN SITU', A DRIVE BAR THAT IS SUPPLIED IN VARIOUS LENGTHS WITH OR WITH OUT A FIXED CLAMP HEAD AND IS QUICK LOADING TO THE ACTUATOR / HANDLE ASSY AND ADJUSTABLE CLAMP HEAD ASSY, THE ADJUSTABLE CLAMP HEAD ASSY' THAT IS ALSO AN INDEPENDENT UNIT CAN BE USED IN GANGED APPLICATIONS, ARRANGEMENTS WHICH IS ONLY LIMITED TO THE LENGTH OF DRIVE BAR EMPLOYED.

THE MODULAR DESIGN REF: Fig 1a. AND 1b IS SUITABLE FOR CLAMPING METHODS MENTIONED ABOVE IN CONJUNCTION IT IS DEVELOPED FOR ALTERNATIVE USES, A CAULKING APPLICATOR WITH ATTACHABLE TUBE HOLDER, WRENCHES WITH INTER - CHANGEABLE JAWS.

THE MODULAR INTERCHANGEABLE BAR CLAMP OFFERS VERSATILITY, CONVENIENCE, FLEXIBILITY AT LOW COST WHICH CAN BE INTERPRETED IN THE ACCOMPANYING DRAWINGS PERTINENT TO THE PRESENT PATENT APPLICATION.

DOCUMENT REFERENCES.

	U.K. PATENT No	2178689	Feb-87
	U.K. PATENT No	2221641	Aug-88
WOOSTER, JR.	U.S.A. PATENT No	5197360	Feb-92
SORENSEN, ET. AL.	U.S.A. PATENT No	5222420	Apr-91
SORENSEN.	U.S.A. PATENT No	320919	Jan-89
LODRICK, SR.	U.S.A. PATENT No	4925169	May-88
CHAPMAN.	U.S.A. PATENT No	4989847	Sep-89
GHAREMANI.	U.S.A. PATENT No	5120056	Feb-90

COX'S PATENT REG. DES'. No : 1013241.

ACCORDING TO THE PRESENT INVENTION THERE IS PROVIDED:

A BAR CLAMP WHICH OFFERS A MODULAR DESIGN TO THE EXISTING RANGE OF BAR CLAMPS AND WILL COMPRISE OF A NUMBER OF INTERCHANGEABLE UNITS WHICH MAKE UP THE BAR CLAMP ASSEMBLY. THE MODULAR DESIGN WILL BE A PRACTICAL ADAPTATION FOR DEVELOPING THE RANGE OF USE FOR PRESENT BAR CLAMPS OF A GENERALLY FRICTIONAL, QUICK RELEASE, ONE HANDED MANIPULATIVE DRIVE BAR MECHANISM TYPE, EITHER OF A COMPRESSIBLE OR TENSILE NATURE WHERE THE DRIVE BAR MECHANISMS ARE OF A DRIVE BAR RETRACTION OR DRIVE BAR EXTENSION CONFIGURATIONS.

A SPECIFIC EMBODIMENT OF THE INVENTION WILL NOW BE DESCRIBED BY WAY OF EXAMPLE WITH REFERENCE TO THE ACCOMPANYING DRAWINGS IN WHICH:-

Figure 1a. IS A COPY OF THE ORIGINAL CONCEPT DRAWING FOR A MODULAR CLAMP, JAN 1989, WHICH HAS A DRIVE BAR RETRACTION MECHANISM.

Figure 1b. IS A SKETCH OF A MODULAR CLAMP WHICH HAS A DRIVE BAR EXTENSION MECHANISM.

Figure 2. IS A SIDE ELEVATION VIEW OF THE ABSTRACT DRAWING, DISPLAYING No 1 THE ACTUATOR / HANDLE ASSEMBLY, No 2 THE ADJUSTABLE CLAMP HEAD ASSEMBLY, No 3 THE MODULAR DRIVE BAR, No 4 THE INTERCHANGEABLE JAW. No 1 AND No 2 ARE IN THE DETACHED POSITION.

Figure 3. IS A SIDE ELEVATION VIEW OF THE CLAMP ASSEMBLY, IN CLAMPING MODE. WHERE 1 AND 2 ARE ATTACHED TO EACH OTHER FACING A FIXED CLAMP HEAD.

Figure 4. IS A SIDE ELEVATION VIEW SHOWING PART OF THE DRIVE BAR WITH A MOUNTED FIXED CLAMP AND AN ADJUSTABLE CLAMP HEAD ASS'Y IN CLAMP MODE, THE ACTUATOR / HANDLE ASS'Y HAS BEEN REMOVED FROM THE DRIVE BAR.

Figure 5. IS A SIDE ELEVATION VIEW DISPLAYING TWO OPPOSING ADJUSTABLE CLAMP HEADS IN SITU' WITH AN ACTUATOR HANDLE ASS'Y DISENGAGED FROM No 2 AND SITUATED AT SOME DISTANCE ALONG THE DRIVE BAR.

DETAILS.	1	ACTUATOR / HANDLE ASSEMBLY
	2	ADJUSTABLE CLAMP HEAD ASSEMBLY
	3	MODULAR DRIVE BAR
	4	INTERCHANGEABLE JAW
	5	HANDLE
	6	PIVOTED HANDLE TRIGGER
	7	DRIVE PLATE
	8	DRIVE PLATE COMPRESSION SPRING
	9	LOCKING DEVICE
	10	ADJUSTABLE CLAMP HEAD
	11	RELEASE TRIGGER COMPRESSION SPRING
	12	RELEASE TRIGGER

Fig 6a-6b ARE SIDE ELEVATION VIEWS OF SOME POSSIBLE CLAMPING ARRANGEMENTS MANAGED ON ONE DRIVE BAR ie IN GANGED CLAMPING MODE WITH No 1 REMOVED.

Figure 7 IS A SIDE ELEVATION VIEW SHOWING A SPREADER TYPE ARRANGEMENT.

Figure 8 IS A SIDE ELEVATION VIEW SHOWING A CAULKING TYPE ARRANGEMENT WITH DETACHABLE CAULKING TUBE HOLDER IN POSITION.

Figures 9, 10, 11, 12. ARE SIDE ELEVATIONS OF THE BASIC INDIVIDUAL SUB - ASSEMBLY COMPONENTS THAT MAKE THE COMPLETE ASSEMBLY REFERRED TO AS THE MODULAR CLAMP.

Fig 9	DRIVE BAR WITH FIXED CLAMP HEAD.
Fig 10	PLAIN DRIVE BAR.
Fig 11	ADJUSTABLE CLAMP HEAD ASSEMBLY.
Fig12	THE ACTUATOR / HANDLE ASSEMBLY.

THE ACTUATOR / HANDLE ASSY' No 1 AS SHOWN IN Figs 2 + 5 INCLUDES A BODY KNOWN AS THE HANDLE No 5 WHICH HAS A CAVITY IN ORDER TO HOUSE THE DRIVE PLATE No 7 AND DRIVE PLATE COMPRESSION SPRING No 8. No 7 WILL HAVE A CENTRALLY POSITIONED SLOTTED HOLE SO AS TO ACCEPT THE DRIVE BAR No 3, No 8 WILL BE LOCATED CENTRALLY ABOUT No 3 ON INSERTION AND ASSY' OF No 3 TO No 1.

THE HANDLE No 5 WILL HAVE TWO SLOTS ALONG THE LONGITUDINAL AXIS EITHER SIDE OF THE CAVITY TO ENABLE THE HANDLE No 5 TO BE MOUNTED ON No 3 AS DRAWN. A PIVOTED HANDLE TRIGGER No 6 WILL ACT AS A LEVER TO ADJUST No 7 AND No 8 SO AS TO RETRACT No 3 DURING OPERATION OF THE ACTUATOR / HANDLE ASSY' No 1. No 5 WILL HAVE A LOCKING DEVICE No 9 IN ORDER TO SECURE No 1 TO THE ADJUSTABLE CLAMP HEAD No 2 TO FACILITATE THE TRANSVERSE MOVEMENT ABOUT THE LONGITUDINAL AXIS OF No 3.

No 1 IS IN THE DISENGAGED NEUTRAL POSITION AS DRAWN IN Fig 5, THE COMPRESSION SPRING No 8 WHICH IS LOCATED LONGITUDINALLY INSIDE THE CAVITY OF No 5, IS CONSTRAINED BY THE REAR INTERNAL SIDE WALL OF THE CAVITY AND FORCES THE DRIVE PLATE No 7 ALSO LOCATED LONGITUDINALLY INSIDE No 5 AGAINST A FIXED STOP WHICH IS THE FORWARD INTERNAL SIDE WALL OF THE CAVITY, IT WILL ALSO COME INTO CONTACT WITH THE PIVOTED HANDLE TRIGGER No 6 THUS RESTRICTING No 6 FROM DISENGAGING FROM ITS ASSY' POSITION AND FIRMLY SECURING IT AGAINST THE HANDLE BODY CAM REBATED AREA AS SHOWN IN Fig 5. THE UPPER PART OF THE PIVOTED HANDLE TRIGGER No 6 IS FORKED SO AS TO CENTRALLY STRADDLE No 5, No 6 IS SUSPENDED FROM No 5 BY MEANS OF PROFILE BOSSES x 2 WHICH ALSO ACT AS CAM LOAD BEARING SURFACES THAT FORM THE PIVOT HINGE ACTING AGAINST No 7 AND No 8 AS SHOWN IN Fig 5.

ON ASSEMBLY THE DRIVE BAR No 3 ENTERS THE ACTUATOR / HANDLE ASSY' No 1 SO AS TO IMPOSE MOVEMENT OF No 3, BY EITHER WAY OF THE TWO SLOTS DEPENDING ON THE USAGE REQUIRED ie CLAMP OR SPREADER AND PASSES THROUGH BOTH No 7 AND No 8 WHICH ARE IN THE NEUTRAL POSITION, No 1 CAN MOVE FREELY ALONG THE LONGITUDINAL AXIS OF No 3 EITHER FORWARD OR REVERSE IN ORDER FOR No 1 TO PERFORM ITS FUNCTION ie TO MANIPULATE No 3, IT WILL BE AFFIXED TO No 2. No 1 WILL HAVE AN EFFECTIVE TRANSVERSE MOVEMENT ALONG No 3 WHEN ASSEMBLED TO No 2.

WHEN THE No 5 AND No 6 ARE COMPRESSED BY THE SQUEEZING ACTION OF THE HAND No 6 WILL ROTATE ABOUT ITS CAM PIVOTAL POSITIONS AND THUS GIVE LEVERAGE IN THE AREA WHERE IT CONTACTS THE DRIVE PLATE No 7, IT WILL FORCE No 7 BACKWARDS AND AT THE SAME TIME TILTING No 7 FROM THE VERTICAL POSITION, THE SLOT IN No 7 NOW ENGAGES No 3 AND IMPOSES A FRICTIONAL LOCK ABOUT No 3, THE DRIVE BAR WILL NOW MOVE INCREMENTALLY BACKWARDS OR RETRACT THROUGH No 1 AND No 2, THE COMPRESSION SPRING No 8 IS COMPRESSED BETWEEN THE REAR INTERNAL CAVITY WALL AND No 7.

ONCE THE MAXIMUM TRAVERSE OF No 3 HAS BEEN COMPLETED OR THE CLAMPING MODE HAS BEEN ATTAINED No 6 IS RELEASED BY OPENING THE HAND, No 8 FORCES No 7 FORWARD THUS CORRECTING THE TILTING POSITION AND FREEING THE FRICTIONAL LOCK BETWEEN No 7 AND No 3. No 7 REVERTS BACK TO ITS NEUTRAL POSITION THAT IS PRESSING AGAINST THE FRONT INTERNAL CAVITY WALL FIXED STOP, IN TURN No 6 ALSO RETURNS BACK TO THE NEUTRAL POSITION WHILST No 3 REMAINS IN ITS NEWLY ADJUSTED POSITION, THE INCREMENTAL MOVEMENT CYCLE IS READY TO BEGIN AGAIN OR IF IN THE CLAMPING MODE No 1 CAN BE REMOVED FROM No 2 BY UNLOCKING No 9 AND WITHDRAWING LONGITUDINALLY BACKWARDS ALONG No 3.

THE ADJUSTABLE CLAMP HEAD ASSY' AS SHOWN IN Figs 2 + 5 INCLUDES A BODY No 10 WHICH HAS ONE SLOT IN THE LONGITUDINAL AXIS SO AS TO ENABLE IT TO BE MOUNTED ONTO THE DRIVE BAR No 3. A TRIGGER RELEASE No 12 WHICH IS PIVOTED AT ONE END INSIDE THE ADJUSTABLE CLAMP HEAD No 10 AND HAS A SLOT SO AS TO PROVIDE ACCESS FOR No 3. A TRIGGER RELEASE COMPRESSION SPRING No 11 WHICH FORCES No 12 FORWARDS SO THAT THE SLOT IN No 12 IS IN CONTACT WITH No 3 AS SHOWN IN THE DISENGAGED NEUTRAL POSITION IN Fig 5, IN THIS POSITION No 11 AND No 12 PREVENT No 2

FROM ANY MOVEMENT BACKWARDS OR SIMILARLY PREVENT ANY MOVEMENT OF No 3 FORWARDS, THIS IS THE FRICTIONAL LOCKING MECHANISM FOR THE CLAMPING ACTION.

TWO SUCH OPPOSING ADJUSTABLE CLAMP HEADS AS SHOWN IN Fig 5 OR A FIXED CLAMP HEAD AS SHOWN IN Fig 3 MOUNTED ON A DRIVE BAR WILL REPRESENT A BASIC BAR CLAMP WITH ALL ITS KNOWN ATTRIBUTES.

BY DEPRESSING No 12 AGAINST THE FRONT PART OF THE BODY OF No 10 WHICH ALSO ACTS AS A RELEASE TRIGGER STOP No 12 DISENGAGES THE FRICTIONAL LOCK IMPOSED ABOUT No 3, No 2 CAN MOVE FREELY ALONG THE LONGITUDINAL AXIS OF No 3 EITHER FORWARD OR REVERSE, WHEN No 2 IS IN THE CLAMPING MODE No 12 ACTS AS A QUICK RELEASE TRIGGER UNLOCKING ANY ACTING COMPRESSIVE - FRICTIONAL FORCES.

CLAIMS

1. A BAR CLAMP WHICH OFFERS A MODULAR DESIGN TO THE EXISTING RANGE OF BAR CLAMPS AND WILL COMPRISE OF A NUMBER OF INTERCHANGEABLE UNITS WHICH MAKE UP THE BAR CLAMP ASSEMBLY. THE MODULAR DESIGN WILL BE A PRACTICAL ADAPTATION FOR DEVELOPING THE RANGE OF USE FOR PRESENT BAR CLAMPS OF A GENERALLY FRICTIONAL, QUICK RELEASE, ONE HANDED MANIPULATIVE DRIVE BAR MECHANISM TYPE, EITHER OF A COMPRESSIBLE OR TENSILE NATURE WHERE THE DRIVE BAR MECHANISMS ARE OF A DRIVE BAR RETRACTION OR DRIVE BAR EXTENSION CONFIGURATIONS.

2. ACCESSORIES CAN ALSO INCORPORATED SO AS TO ALTER / IMPROVE THE BASIC FUNCTIONAL ABILITY OF THE BAR CLAMP DESIGN ie CAULKING TUBE APPLICATOR, WRENCH TYPE DEVICES WITH SUITABLE INTERCHANGEABLE JAWS, SPREADERS, A LARGE RANGE OF CLAMPING DISTANCES IS PROVIDED BY QUICK LOADING MODULAR DRIVE BAR CHANGES.

3. THE DETACHABLE HANDLE ASSEMBLY IS MOUNTED ON THE DRIVE BAR WHEN ASSEMBLED AND WILL BE THE ACTUATOR FOR THE ADJUSTABLE CLAMP HEAD, IT WILL COMPRISE OF A COMPRESSION SPRING, A DRIVE PLATE, HANDLE / ACTUATOR MAIN BODY, A PIVOTED TRIGGER AND LOCKING DEVICE.

4. THE ADJUSTABLE CLAMP HEAD IS ALSO DETACHABLE FROM THE DRIVE BAR WHEN NOT IN USE, WHEN MOUNTED ON THE DRIVE BAR IT WILL FUNCTION AS AN ADJUSTABLE CLAMPING JAW, WHEN ATTACHED TO THE ACTUATOR MAIN BODY BY MEANS OF A LOCKING DEVICE eg PIN, LATCH, FRICTIONAL GRIP. IT WILL COMPRISE OF A RELEASE TRIGGER, TRIGGER COMPRESSION SPRING, ADJUSTABLE CLAMPING HEAD AND SOFT JAW. THE SOFT JAW CAN BE INTERCHANGEABLE AS CLAIMED IN CLAIM 1 AND 2.

5. BOTH THE DETACHABLE HANDLE ASSEMBLY AND THE ADJUSTABLE CLAMP HEAD CAN BE INDEPENDENTLY REVERSIBLE ABOUT THE LONGITUDINAL AXIS OF THE DRIVE BAR.

6. THE HANDLE ASSEMBLY AND THE ADJUSTABLE CLAMP HEAD ONCE ASSEMBLED WILL CONTROL THE MOVEMENT AND FUNCTION OF THE DRIVE BAR.

7. THE DRIVE BAR COMPLETES THE BASIC BAR CLAMP ASSEMBLY THE DRIVE BAR SHALL HAVE MOUNTED TO IT AT THE OPPOSING END OF THE ACTUATOR ASSEMBLY AN ADJUSTABLE CLAMP HEAD AND OR FIXED CLAMP HEAD SO AS TO COMPLETE A COMPRESSIVE OR TENSILE CLAMPING FUNCTION. THE DRIVE BAR MAY BE SUPPLIED IN VARIOUS LENGTHS AS CLAIMED IN CLAIM 1 AND 2.

8. ONCE THE CLAMP IS IN SITU' THE HANDLE ASSEMBLY CAN BE UNLOCKED FROM THE ADJUSTABLE CLAMP HEAD AND REMOVED FROM THE DRIVE BAR IT IS NOW FREE TO BE USED IN AN OTHER OPERATION. AS CLAIMED IN CLAIM 1 AND 2.

9. TO REMOVE THE ADJUSTABLE CLAMP HEAD ON COMPLETION OF ITS FUNCTION, DEPRESS THE RELEASE TRIGGER AND PULL BACK, IF REQUIRED REMOVE THE ADJUSTABLE CLAMP HEAD FROM THE DRIVE BAR AS CLAIMED IN CLAIM 1 AND 2.

10. ANY NUMBER OF ADJUSTABLE CLAMPING HEADS CAN BE CONFIGURED ALONG THE SAME DRIVE BAR FOR SPECIAL CLAMPING ARRANGEMENTS AS CLAIMED IN CLAIM 2.

11. A MODULAR BAR CLAMP SUBSTANTIALLY AS DESCRIBED HEREIN WITH REFERENCE TO FIGURES 1 TO 12 OF THE ACCOMPANYING DRAWINGS.

Amendments to the claims have been filed as follows

1. A BAR CLAMP WHICH OFFERS A MODULAR DESIGN TO THE EXISTING RANGE OF BAR CLAMPS AND WILL COMPRISE OF A NUMBER OF INTERCHANGEABLE UNITS WHICH MAKE UP THE BAR CLAMP ASSEMBLY. THE MODULAR DESIGN WILL BE A PRACTICAL ADAPTATION FOR DEVELOPING THE RANGE OF USE FOR PRESENT BAR CLAMPS OF A GENERALLY FRICTIONAL, QUICK RELEASE, ONE HANDED MANIPULATIVE DRIVE BAR MECHANISM TYPE, EITHER OF A COMPRESSIBLE OR TENSILE NATURE WHERE THE DRIVE BAR MECHANISMS ARE OF A DRIVE BAR RETRACTION OR DRIVE BAR EXTENSION CONFIGURATIONS.

2. ACCESSORIES CAN ALSO INCORPORATED SO AS TO ALTER / IMPROVE THE BASIC FUNCTIONAL ABILITY OF THE BAR CLAMP DESIGN ie CAULKING TUBE APPLICATOR, WRENCH TYPE DEVICES WITH SUITABLE INTERCHANGEABLE JAWS, SPREADERS, A LARGE RANGE OF CLAMPING DISTANCES IS PROVIDED BY QUICK LOADING MODULAR DRIVE BAR CHANGES.

3. THE ACTUATOR/HANDLE ASSEMBLY CAN BE DETACHED FROM BOTH THE DRIVE BAR AND THE ADJUSTABLE CLAMP HEAD ASSEMBLY, WHEN IN USE IT IS MOUNTED ON THE DRIVE BAR AND ASSEMBLED TO THE ADJUSTABLE CLAMP HEAD ASSEMBLY. THE ASSEMBLY ACTUATES THE ADJUSTABLE CLAMP HEAD ASSEMBLY TO FORM ONE HALF OF THE CLAMPS COMPRESSIVE OR TENSILE FUNCTIONAL FORCE. IT WILL COMPRISE OF A COMPRESSION SPRING, A DRIVE PLATE, HANDLE / ACTUATOR MAIN BODY, A PIVOTED, HANDLE TRIGGER AS CLAIMED IN CLAIM 1.

4. THE ADJUSTABLE CLAMP HEAD ASSEMBLY IS ALSO DETACHABLE FROM THE DRIVE BAR WHEN NOT IN USE, WHEN MOUNTED ON THE DRIVE BAR, DIRECTLY OPPOSING ANOTHER ADJUSTABLE CLAMP HEAD ASSEMBLY IT WILL FUNCTION AS A QUICK RELEASE ADJUSTABLE CLAMPING JAW, WHEN ATTACHED TO THE ACTUATOR / HANDLE ASSEMBLY BY MEANS OF A LOCKING DEVICE eg PIN, LATCH, FRICTIONAL GRIP, IT WILL ALSO FUNCTION AS A QUICK RELEASE ADJUSTABLE CLAMPING JAW, IT WILL COMPRISE OF A RELEASE TRIGGER, RELEASE TRIGGER COMPRESSION SPRING, ADJUSTABLE CLAMP HEAD AND SOFT JAW, THE SOFT JAW CAN BE INTERCHANGEABLE AS CLAIMED IN CLAIM 1 AND 2.

5. BOTH THE DETACHABLE ACTUATOR/HANDLE ASSEMBLY AND THE DETACHABLE ADJUSTABLE CLAMP HEAD ASSEMBLY CAN BE INDEPENDENTLY REVERSED ABOUT THE LONGITUDINAL AXIS OF THE DRIVE BAR. THE ADJUSTABLE CLAMP HEAD ASSEMBLY CAN BE EMPLOYED IN TANDEM CONFIGURATIONS WITHOUT THE REQUIREMENTS OF DRIVE BAR MECHANICAL FIXED STOP LOCATIONS AS CLAIMED IN CLAIMS 1, 3 AND 4.

6. THE ACTUATOR/ HANDLE ASSEMBLY AND THE ADJUSTABLE CLAMP HEAD ASSEMBLY ONCE ASSEMBLED WILL CONTROL THE MOVEMENT AND FUNCTION OF THE DRIVE BAR AS CLAIMED IN CLAIM 1 AND 2.

7. THE DRIVE BAR COMPLETES THE BASIC BAR CLAMP ASSEMBLY, THE DRIVE BAR SHALL HAVE MOUNTED TO IT AT THE OPPOSING END OF THE ACTUATOR ASSEMBLY AN ADJUSTABLE CLAMP HEAD ASSEMBLY AND OR FIXED CLAMP HEAD SO AS TO COMPLETE THE COMPRESSIVE OR TENSILE CLAMPING FUNCTION. THE DRIVE BAR MAY BE SUPPLIED IN VARIOUS INTERCHANGEABLE LENGTHS AS CLAIMED IN CLAIM 1, 2 AND 5.

8. ONCE THE CLAMP IS IN SITU' THE ACTUATOR/HANDLE ASSEMBLY CAN BE UNLOCKED FROM THE ADJUSTABLE CLAMP HEAD ASSEMBLY AND REMOVED FROM THE DRIVE BAR TO BE USED IN AN OTHER OPERATION. AS CLAIMED IN CLAIM 1, 2 AND 3.

CLAIMS

9. TO REMOVE THE ADJUSTABLE CLAMP HEAD ASSEMBLEY ON COMPLETION OF ITS FUNCTION DEPRESS THE RELEASE TRIGGER AND PULL BACK, IF REQUIRED REMOVE THE ADJUSTABLE CLAMP HEAD ASSEMBLY FROM THE DRIVE BAR AS CLAIMED IN CLAIM 1 2 AND 4.

10. ANY NUMBER OF ADJUSTABLE CLAMP HEAD ASSEMBLIES CAN BE CONFIGURED ALONG THE SAME DRIVE BAR, DEPENDING ON THE DRIVE BAR LENGTH EMPLOYED FOR SPECIAL CLAMPING ARRANGEMENTS AS CLAIMED IN CLAIM 5.

11. A MODULAR BAR CLAMP SUBSTANTIALLY AS DESCRIBED HEREIN WITH REFERENCE TO FIGURES 1 TO 12 OF THE ACCOMPANYING DRAWINGS.

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Application No: GB 0113033.5
Claims searched: 1 to 11

Examiner: Gareth Prothero
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Databases searched:

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Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2273073 A	(PETERSEN) See especially figs 1, 9 and 10, and p12, paragraph 3 to p13, paragraph 1.	1 to 3, 5 to 7, 9 & 10
X	GB 2204263 A	(RHOMBUS) See especially fig 5, and p8 paragraph 2.	1, 5, 7 & 9
X	WO 99/44789 A1	(AMERICAN TOOLS) See especially figs 14 to 16, and 20.	1 to 3, 5 to 7, 9 & 10
X	WO 95/13165 A1	(HOBDAY CLAMP) See especially fig 1, and p4, lines 14 to 37.	1 to 3, 5 to 7, 9 & 10
X	US 5775680 A	(SORENSEN et al.) See especially fig 1.	1, 5, 7 & 9
X	US 5443246 A	(PETERSON) See especially fig 1, and col 2, lines 36 to 49.	1, 5, 7 & 9

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.